

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. (Currently amended) An isolated nucleic acid comprising a polynucleotide sequence, or complement thereof, encoding a polypeptide comprising
~~an amino acid sequence at least 40% identical to DMT Domain A (SEQ ID NO:71),; or~~
~~an amino acid sequence at least 40% identical to DMT Domain B (SEQ ID NO:72),; or~~
~~an amino acid sequence at least 40% identical to DMT Domain C (SEQ ID NO:73),; or~~
~~a combination thereof wherein the polypeptide is capable of exhibiting at least one of the following biological activities:~~

- (a) glycosylase activity;
(b) demethylation of polynucleotides;
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(c) DNA repair;
(d) modulation of organ identity;
(e) modulation of organ number;
(f) modulation of meristem size and/or activity;
(g) modulation of flowering time;
(h) modulation of methylation of chromosomal DNA in the cell;
(i) modulation of endosperm development;
(j) modulation of expression of the MEDEA gene.

2. (Original) The isolated nucleic acid of claim 1, wherein the polypeptide is at least 70% identical to SEQ ID NO:2.

3. (Original) The isolated nucleic acid of claim 1, wherein the polypeptide is SEQ ID NO:2.

4 and 5. (Canceled)

6. (Original) The nucleic acid of claim 5, wherein the polypeptide comprises either a

- (i) basic region;
- (ii) nuclear localization signal;
- (iii) leucine zipper;
- (iv) helix-hairpin-helix structure;
- (v) glycine-proline rich loop with a terminal aspartic acid or
- (vi) helix that is capable of binding DNA.

7. (Currently amended) The isolated nucleic acid of claim 1, wherein the nucleic acid further comprises a promoter operably linked to the polynucleotide sequence.

8. (Original) The isolated nucleic acid of claim 7, wherein the promoter is a constitutive promoter.

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9-12. (Withdrawn)

13. (Currently amended) An expression cassette comprising a promoter operably linked to a heterologous polynucleotide sequence, or a complement thereof, encoding the a polypeptide of claim 1 comprising SEQ ID NO:71, SEQ ID NO:72, or SEQ ID NO:73, wherein the promoter is heterologous to the polynucleotide sequence, and wherein the polypeptide is capable of exhibiting at least one of the following biological activities:

- (a) glycosylase activity;
- (b) demethylation of polynucleotides;
- (c) DNA repair;
- (d) modulation of organ identity;
- (e) modulation of organ number;
- (f) modulation of meristem size and/or activity;
- (g) modulation of flowering time;
- (h) modulation of methylation of chromosomal DNA in the cell;
- (i) modulation of endosperm development;

(j) modulation of expression of the MEDEA gene.

14. (Withdrawn)

15. (Currently amended) A host cell comprising an exogenous ~~polynucleotide sequence nucleic acid~~ comprising a polynucleotide sequence, or complement thereof, encoding the polypeptide of claim 1 comprising SEQ ID NO:71, SEQ ID NO:72, or SEQ ID NO:73, wherein the polypeptide is capable of exhibiting at least one of the following biological activities:

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- (a) glycosylase activity;
 - (b) demethylation of polynucleotides;
 - (c) DNA repair;
 - (d) modulation of organ identity;
 - (e) modulation of organ number;
 - (f) modulation of meristem size and/or activity;
 - (g) modulation of flowering time;
 - (h) modulation of methylation of chromosomal DNA in the cell;
 - (i) modulation of endosperm development;
 - (j) modulation of expression of the MEDEA gene.

16. (Original) The host cell of claim 15, wherein the nucleic acid further comprises a promoter operably linked to the polynucleotide sequence.

17. (Original) The host cell of claim 16, wherein the host cell is a plant cell.

18. (Currently amended) A method of modulating transcription, the method comprising,

- (a) introducing into a host cell ~~an~~ the expression cassette of claim 13; and
- (b) selecting a host cell with modulated transcription, wherein the modulated transcription is determined by comparing the level of transcription in the host cell with the level of transcription in a cell that does not comprise the expression cassette of claim 13.

19. (Original) The method of claim 18, wherein the expression cassette is introduced by Agrobacterium.

20. (Original) The method of claim 18, wherein the expression cassette is introduced by a sexual cross.

21. (Original) The method of claim 18, wherein the polypeptide is capable of exhibiting at least one of the following biological activities:

- (a) wherein enhanced expression of the polypeptide in a plant results in a delay in flowering time;
- (b) wherein introduction of the polypeptide into a cell results in modulation of methylation of chromosomal DNA in the cell;
- (c) wherein reduction of expression of the polypeptide in a plant results in enhanced endosperm development;
- (d) wherein expression of the polypeptide in an *Arabidopsis* leaf results in expression of the MEDEA gene.

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cont
22-23. (Withdrawn)

24. (Currently amended) A transgenic plant cell or transgenic plant comprising a polynucleotide sequence, or complement thereof, encoding a polypeptide ~~of claim 1~~ comprising SEQ ID NO:71, SEQ ID NO:72, or SEQ ID NO:73, wherein the polypeptide is capable of exhibiting at least one of the following biological activities:

- (a) glycosylase activity;
- (b) demethylation of polynucleotides;
- (c) DNA repair;
- (d) modulation of organ identity;
- (e) modulation of organ number;
- (f) modulation of meristem size and/or activity;
- (g) modulation of flowering time;

- (h) modulation of methylation of chromosomal DNA in the cell;
- (i) modulation of endosperm development;
- (j) modulation of expression of the MEDEA gene.

25. (Currently amended) A plant which has been regenerated from a the plant cell according to 24.

26. (Original) The plant of claim 25, wherein the polypeptide is capable of exhibiting at least one of the following biological activities:

- (a) wherein enhanced expression of the polypeptide in a plant results in a delay in flowering time;
- (b) wherein introduction of the polypeptide into a cell results in modulation of methylation of chromosomal DNA in the cell;
- (c) wherein reduction of expression of the polypeptide in a plant results in enhanced endosperm development;
- (d) wherein expression of the polypeptide in an Arabidopsis leaf results in expression of the MEDEA gene.

27-29. (Withdrawn)

30. (New) The isolated nucleic acid of claim 1, wherein the polypeptide comprises SEQ ID NO:71, SEQ ID NO:72, and SEQ ID NO:73.

31. (New) The expression cassette of claim 13, wherein the polypeptide comprises SEQ ID NO:71, SEQ ID NO:72, and SEQ ID NO:73.

32. (New) The host cell of claim 15, wherein the polypeptide comprises SEQ ID NO:71, SEQ ID NO:72, and SEQ ID NO:73.

33. (New) The transgenic plant cell or transgenic plant of claim 24, wherein the polypeptide comprises SEQ ID NO:71, SEQ ID NO:72, and SEQ ID NO:73.